

What is claimed is:

1. A method for determining link level performance in a communication system, comprising:
  - determining a detection metric for one or more given wireless channel coefficients representing a plurality of wireless channel realizations;
  - selecting a conditional detection probability based on the determined detection metric; and
  - calculating a link level performance result based on the selected conditional detection probability.
2. The method of claim 1, wherein
  - the wireless channel is an access channel, and
  - calculating a link level performance result includes calculating a detection indicator value that represents a detection success or a detection failure of the access channel.
3. The method of claim 1, wherein the conditional detection probability is selected without substantial link-level processing during a system simulation of the communication system.
4. The method of claim 1, wherein selecting includes accessing a look-up table to select a conditional detection probability corresponding to the determined detection metric and a given threshold value.
5. The method of claim 4, wherein
  - the given threshold value is calculated in advance as a function of a probability of an erroneous detection when a signal to be received over a given wireless channel realization is not present.
6. The method of claim 2, wherein
  - calculating the detection indicator value includes:

comparing the selected conditional detection probability to a randomly-generated number, and  
outputting the detection indicator value if the selected conditional detection probability equals or exceeds the randomly-generated number.

7. The method of claim 2, wherein the determining, accessing and calculating are repeated for a plurality of wireless access channel realizations, the method further comprising:

averaging the detection indicator value over the plurality of wireless access channel realizations;

wherein calculating a link level performance result includes determining an unconditional detection probability for all wireless access channel realizations based on the average detection indicator value.

8. The method of claim 1, wherein

the wireless channel is an access channel, and

the detection metric is an instantaneous detection metric of the access channel that is a function of one or more of transmit power, a wireless channel coefficient of the access channel, a spatial processing result from subjecting the access channel to spatial processing, and a temporal processing result from subjecting the access channel to temporal processing.

9. A method for determining random access channel (RACH) preamble detection performance in a communication system, comprising:

determining, for each given RACH preamble of a plurality of wireless channel realizations, a conditional detection probability, the conditional detection probability determined without substantial link-level processing during a system simulation of the communication system; and

calculating an unconditional detection probability for determining RACH preamble detection performance as an average detection probability over the plurality of wireless channel realizations.

10. The method of claim 9, wherein calculating an unconditional detection probability includes calculating a detection indicator value that represents a detection success or a detection failure of a RACH preamble.

11. The method of claim 10, wherein  
calculating the detection indicator value includes:  
comparing the selected conditional detection probability to a  
randomly-generated number, and  
outputting the detection indicator value if the selected  
conditional detection probability equals or exceeds the randomly-  
generated number.

12. The method of claim 11, wherein  
calculating the detection indicator value is repeated for each of the  
plurality of wireless channel realizations, and  
calculating the unconditional detection probability further comprises  
averaging the detection indicator value over the plurality of wireless channel  
realizations, the unconditional detection probability determined based on the  
average detection indicator value.

13. The method of claim 9, wherein determining a conditional detection  
probability includes:  
determining a detection metric for a given wireless channel realization;  
and  
accessing a look-up table to select a conditional detection probability  
corresponding to the determined detection metric.

14. The method of claim 13, wherein the detection metric is an instantaneous  
detection metric of a given wireless channel that is a function of one or more  
of transmit power, a wireless channel coefficient of the given RACH preamble,  
a spatial processing result from subjecting the RACH preamble to spatial  
processing, and a temporal processing result from subjecting the RACH  
preamble to temporal processing.

15. The method of claim 14, wherein  
the given threshold is calculated in advance as a function of a  
probability of an erroneous detection of the given RACH preamble.